PSITTACOSIS

✓DISEASE AND EPIDEMIOLOGY

Clinical Description:

The clinical presentation of psittacosis may include fever, headache, rash, myalgia (muscle aches), chills, and upper or lower respiratory tract disease. Systemic illness can occur with pneumonia. A cough may or may not be present, and respiratory symptoms often seem milder than would be expected based on chest x-ray findings. Human disease can be severe (including encephalitis and myocarditis), especially in untreated elderly people, although it is usually mild or moderate for others. Relapses of illness may occur.

C. psittaci can affect organ systems other than the respiratory tract and result in endocarditis, myocarditis, hepatitis, and fetal death has been reported in pregnant women.

Causative Agent:

Chlamydophila psittaci (formerly *Chlamydia psittaci)* is an intracellular bacterium that causes psittacosis.

Differential Diagnosis:

The differential diagnosis of psittacosis-related pneumonia includes infection with *Coxiella burnetti, Mycoplasma pneumodiae, Chlamydia pneumoniae, Legionella* spp, and respiratory viruses (e.g., influenza).

Laboratory identification:

- Isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid, or tissue), or blood, or
- Fourfold or greater increase in antibody (Immunoglobulin G [IgG]) against *C. psittaci* by complement fixation (CF) or microimmunofluorescence (MIF) between paired acute- and convalescent-phase serum specimens obtained at least 2-4 weeks apart , or
- Supportive serology (e.g. *C. psittaci* antibody titer [Immunoglobulin M (IgM)] of greater than or equal to 32 in at least one serum specimen obtained after onset of symptoms), or
- Detection of *C. psittaci* DNA in a respiratory specimen (e.g. sputum, pleural fluid or tissue) via amplification of a specific target by polymerase chain reaction (PCR) assay.

Treatment:
Antibiotics in the tetracycline group, given to those over eight years of age, until 10-14 days after temperature returns to normal. Erythromycin is an alternative when tetracycline is contraindicated (in pregnancy and in children under eight).

Case fatality:
Rare, however, fatalities have been reported.

Reservoir:
C. psittaci is found primarily in psittacine birds (parrots, parakeets, macaws, love birds, and cockatoos). Pigeons and some poultry (turkeys, geese, and ducks) may also shed the infectious agent.

Transmission:
Human illness occurs from inhalation of the bacteria in dried droppings, secretions, and dust from feathers of infected birds. Many seemingly healthy birds may shed the agent when stressed by crowding or transport. Pet birds are often implicated, especially when owners clean a cage containing dried droppings. Occupational exposure can also occur when workers are exposed to areas with contaminated dust during clean up, repair, or demolition. Laboratory-acquired infections have occurred as well. Farms or rendering plants may also be a source of exposure. *C. psittaci* is resistant to drying and can remain infectious for several months. Person-to-person transmission (through paroxysmal coughing during acute illness) has rarely been reported and is not considered to present a significant risk.

Susceptibility:
Susceptibility is general, post-infection immunity incomplete and transitory. Older adults may be more severely affected. There is no evidence that persons with antibodies are protected.

Incubation period:
The incubation period for psittacosis can range from 1–4 weeks, but is usually 7–14 days.

Period of communicability:
Infected birds, including those that appear to be healthy, can be lifetime carriers or can have continuous or intermittent shedding periods of weeks or even months. If humans are contagious at all, it is during paroxysmal coughing with acute illness.

Epidemiology:
Psittacosis occurs worldwide and year-round. Most human cases are sporadic. Human outbreaks of psittacosis occasionally occur in individual households, pet shops, aviaries, and avian exhibits in zoos. Outbreaks among birds can occur in poultry flocks or in other groups of birds, such as Asian pet stores. Quarantine of imported birds and treatment of

infected birds with antibiotics reduce the risk of disease transmission from birds. Utah averages 0.4 cases of psittacosis a year.

✓PUBLIC HEALTH CONTROL MEASURES

Public health responsibility:

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of this disease.
- Identify sources of exposure and stop further transmission.

Prevention:

Personal Preventive Measures/Education

To avoid exposure, the UDOH recommends that:

- Birds should be obtained only from a licensed pet store or aviary.
- Pet owners and animal handlers should be made aware of the dangers of household or occupational exposure to infected birds and the risk of inhalation of dried bird droppings, even from seemingly healthy birds that can shed the organism intermittently. The organism is environmentally labile but can remain infectious for several months if protected by organic matter. Medical personnel who take care of people in poultry processing plants or other workers in high-risk occupations should learn to include psittacosis in their differential diagnosis for workers who become sick with febrile illness and myalgia.
- Psittacine birds that are bought, traded, or otherwise procured should be raised and handled in a way that prohibits psittacosis spread. Tetracycline can be used to control or prevent disease in birds, although treatment failures can occur.
- Any pet stores, farms, or processing plants that are epidemiologically-linked to human psittacosis should be part of a surveillance effort to identify other cases. Any infected birds should be treated or destroyed, and the environments should be thoroughly disinfected.
- All persons in contact with infected birds or contaminated materials should wear appropriate personal protective equipment to decrease the risk of exposure. Protective clothing, gloves, and an appropriately fitted respirator (N95 or higher rating) should be used when cleaning cages or handling infected birds.
- Precautions should be used against aerosolization of contaminated materials while cleaning cages by wetting the cage with a disinfectant solution.

Chemoprophylaxis:

None

Vaccine:

None

Isolation and quarantine requirements:

None for humans. Potentially farms, pet stores and processing plants with farms could be quarantined.

Bioterrorist Potential

C. psittaci is considered by the Centers for Disease Control and Prevention (CDC) as a Category B bioterrorist agent. If acquired and properly disseminated, *C. psittaci* could cause a serious public health challenge.

✓CASE INVESTIGATION

Reporting:

- Report all suspect and confirmed cases of Psittacosis.

Psittacosis (2010)

Clinical description

Psittacosis is an illness characterized by fever, chills, headache, myalgia, and a dry cough with pneumonia often evident on chest x-ray. Severe pneumonia requiring intensive-care support, endocarditis, hepatitis, and neurologic complications occasionally occur.

Laboratory criteria for diagnosis

- Isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid, or tissue), or blood, or
- Fourfold or greater increase in antibody (Immunoglobulin G [IgG]) against *C. psittaci* by complement fixation (CF) or microimmunofluorescence (MIF) between paired acute- and convalescent-phase serum specimens obtained at least 2-4 weeks apart , or
- Supportive serology (e.g. *C. psittaci* antibody titer [Immunoglobulin M (IgM)] of greater than or equal to 32 in at least one serum specimen obtained after onset of symptoms), or
- Detection of *C. psittaci* DNA in a respiratory specimen (e.g. sputum, pleural fluid or tissue) via amplification of a specific target by polymerase chain reaction (PCR) assay.

Case classification

Probable: An illness characterized by fever, chills, headache, cough and myalgia that has either:

- Supportive serology (e.g. *C. psittaci* antibody titer [Immunoglobulin M, IgM] of greater than or equal to 32 in at least one serum specimen obtained after onset of symptoms), OR
- Detection of *C. psittaci* DNA in a respiratory specimen (e.g. sputum, pleural fluid or tissue) via amplification of a specific target by polymerase chain reaction (PCR) assay.

Confirmed: An illness characterized by fever, chills, headache, cough and myalgia, and laboratory confirmed by either:

- Isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid, or tissue), or blood, OR
- Fourfold or greater increase in antibody (Immunoglobulin G [IgG]) against *C. psittaci* by complement fixation (CF) or microimmunofluorescence (MIF) between paired acute- and convalescent-phase serum specimens obtained at least 2-4 weeks apart.

Comment

Although MIF has shown greater specificity to *C. psittaci* than CF, positive serologic findings by both techniques may occur as a result of infection with other Chlamydia species and should be interpreted with caution. To increase the reliability of test results, acute- and convalescent-phase serum specimens should be analyzed at the same time in the same laboratory. A realtime polymerase chain reaction (rtPCR) has been developed and validated in avian specimens but has not yet been validated for use in humans (1).

Classification Table

Criterion	Case Definition	
Clinical Presentation	Confirmed	Probable
Fever	O	O
Chills	O	O
Headache	O	O
Cough	O	O
Myalgia	O	O
Laboratory findings		
isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid or tissue), or blood, or	O	

fourfold or greater increase in antibody (IgG) against *C. psittaci* by complement fixation (CF) between paired acute- and convalescent-phase serum specimens obtained a minimum of 2 weeks apart	O	
fourfold or greater increase in antibody (IgG) against *C. psittaci* by microimmunofluorescence (MIF) between paired acute- and convalescent- phase serum specimens obtained a minimum of 2 weeks apart	O	
titer of antibody against *C. psittaci* (IgM) of at least 1:32 by CF or MIF in one or more serum specimens obtained after onset of symptoms		O
detection of *C. psittaci* DNA in a respiratory specimen (e.g. sputum, pleural fluid or tissue) via amplification of a specific target by PCR assay		O
Epidemiological risk factors		
exposure to the same dried bird secretions as a confirmed case of psittacosis	C	C
exposure to birds, bird owners, pet shop employees, veterinarians, and those working in poultry processing plants	C	C

Case Investigation Process:

- Fill out morbidity form
- Verify case status.
- Fill out disease investigation form.
- Determine whether patient had travel/exposure history consistent with acquisition of disease in Utah or elsewhere.
- If patient acquired disease in Utah, identify the source of transmission and eliminate it.
- Use the approximate incubation period range for psittacosis (1–4 weeks) to record exposure history. Specifically, focus on the period beginning about one week prior to the case's onset date back to approximately four weeks before onset for the following exposures:
    - Occupation/duties: Determine the occupation of the case. Determine whether the case had any occupational exposure to birds or other animals (e.g., farmer, pet store worker).
    - Bird contact: Ask the case about contact with birds (psittacine birds, pigeons, domestic fowl, or other birds). If possible, indicate the type(s),

number of bird(s), and health of the bird(s) to which the case was exposed.
- Contact with a human case of psittacosis: Ask the case if he/she had recent contact with a person who has/had pneumonia.
- Indicate where and when any of the above exposures occurred.
- Investigate the source of infection. Record any information regarding the location, health, and testing of birds suspected as the case's source of infection.

Disease in Birds

Psittacosis diagnosed in a bird is reportable to the Utah Department of Agriculture and Food (UDAF). If evidence suggests that humans exposed to infected birds have become sick with psittacosis, a disease investigation will begin, ensuring that any sick persons receive medical attention and that exposed individuals are educated about their potential risk. In cases without human illness, the UDOH or LHD should be aware of the situation so that concerned individuals can be given information about psittacosis, their risk of exposure, and the need to see a physician if they have been exposed and if they develop respiratory illness. When a bird in a pet store or one recently purchased from a pet store has been diagnosed with psittacosis, control measures in birds may be instituted whether or not human cases have occurred as a result of exposure to the diseased bird. These measures could include quarantine, treatment of exposed birds, and proper disinfection of cages and other surfaces. Other control measures—including notifying the pet store owner and workers of the diagnosis and their possible risk of disease, as well as notifying the public who may have visited the store, by posting public health notices at the store— would be taken in collaboration with the UDAF and UDOH/LHD. In addition, depending on the situation, the LHD may contact individuals who have purchased birds from the facility to inform them about psittacosis, about the possibility that their birds may be carriers, and about the potential risks to their health.

In addition to pet shops, there are other high-risk environments in which psittacosis can occur (e.g., poultry farms). In the situation where a diseased bird is identified, control measures similar to those described above (e.g., quarantine, treatment of exposed birds, disinfection of the animal's environment, and notification of exposed individuals about their risk for disease) would be instituted by the UDAF, in collaboration with the UDOH/LHD.

Outbreaks:

Any cluster of illness among humans would be considered an outbreak.

Identification of case contacts:

Psittacosis is rarely spread person-to-person.

Case contact management:

None

✓REFERENCES

1. Mitchell, S.L., Wolff, B.J., Thacker, W.L., Ciembor, P.G., Gregory, C.R., Everett, K.D., Ritchie, B.W., & Winchell, J.M. (2009). Genotyping of Chlamydophila psittaci by real-time PCR and high-resolution melt analysis. J Clin Microbiol, 47(1),175-181
2. Centers for Disease Control, Case Definitions for Infectious Conditions Under Public
3. Health Surveillance. MMWR 46 (RR-10), 1997.l
4. Control of Communicable Diseases Manual (18th Edition), Heymann, D.L., Ed; 2004.
5. Red Book: 2003 Report of the Committee on Infectious Diseases (26th Edition), Larry K.
6. Pickering MD, Ed; 2003.
7. Massachusetts Department of Health Psittacosis Disease Plan
8. Centers for Disease Control Psittacosis Disease Listing
9. Johns Hopkins Point of Care Information Technology
10. Principles and Practice of Infectious Disease (6th Edition), Gerald L. Mandell, John E.
11. Bennett, and Raphael Dolin Eds; 2005.
12. Council for State and Territorial Epidemiologists (CSTE) Position Statements. Available from URL: http://www.cste.org/default.asp?page=PositionStatements